REMARKS

Claims 1 and 3-29 are currently pending, wherein claim 2 has been canceled, claims 1 and 16 have been amended to include the subject matter of canceled claim 2, and claim 3 has been amended to depend from claim 1. Favorable reconsideration is respectfully requested in view of the above-identified amendments and the remarks presented herein below.

At the outset, Applicants note with appreciation the indication that claims 4, 7, 8, 10, 11, 13-15 and 17-23 contain allowable subject matter and would be allowed if re-written in independent form.

On page 2, the Office Action rejects claims 1 and 12 under 35 U.S.C. §102(b) as allegedly being anticipated by International Publication No. WO 93/00777 ("Dahlman"). Applicant respectfully traverses this rejection.

In mobile communication systems, signals transmitted between base stations and mobile stations typically suffer from echo distortion or time dispersion (multi-path delay). Obstructions, for example, large buildings or nearby mountain ranges, cause a signal to proceed to the receiver along not one, but many paths. The receiver receives a composite signal of multiple versions of the transmitted signal that have propagated along different paths (referred to as "rays"). In order to optimally detect the transmitted signal, a device known as a searcher finds the different rays, and another device known as a RAKE receiver "rakes" them together. However, if the receiver is not stationary, for example the receiver is a mobile hand-held unit, the rays found by the searcher may no longer be the best rays due to the movement of the receiver. Searching for new rays is computationally complex, time consuming and decreases the battery life of the receiver. Therefore there is a need for a method to determine when searching for new rays is necessary. The need to search for new paths and the time delay of the new paths is largely dependent on the relative velocity of the receiver. Therefore, if the receiver can determine the Doppler frequency of the mobile, the receiver can determine whether the mobile has moved and whether searching for new paths is necessary.

Accordingly, independent claim 1, as amended, defines an apparatus that includes, *inter alia*, a Doppler frequency estimator comprising a normalizer which is configured to normalize at least two channel estimates.

Dahlman appears to disclose a method and apparatus for approximating the doppler frequency of a mobile station by examining the signal between the mobile station and a base station. Several channel estimates are calculated at different time intervals, and the difference between these channel estimates is used to determine the approximate doppler frequency of the mobile station. (See page 5, line 23 through page 6, line 24 of Dahlman).

It is well known that in order to support a rejection under 35 U.S.C. §102, the applied reference must teach each and every claimed element. In the present case, independent claim 1 is not anticipated by Dahlman for at least the reason that Dahlman fails to disclose a Doppler frequency estimator comprising a normalizer as claimed.

Claim 12 depends from independent claim 1. Therefore, claim 12 is patentably distinguishable over Dahlman for at least those reasons presented above with respect to claim 12. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 1 and 12 under 35 U.S.C. §102.

On page 3, the Office Action rejects claims 2, 3, 5 and 6 under 35 U.S.C. §103(a) as allegedly being unpatentable over Dahlman in view of U.S. Patent No. 6,424,642 to Schmidl et al. ("Schmidl"). Applicant respectfully traverses this rejection.

Claims 3, 5 and 6 variously depend from independent claim 1 which, as amended, includes the features of canceled claim 2. Accordingly, claims 3, 5 and 6 are patentably distinguishable over Dahlman for at least those reasons presented above with respect to claim 1.

Schmidl discloses a method of estimating Doppler frequency through autocorrelation of pilot symbols. According to the method of Schmidl, known values of Bessel functions are used to estimate Doppler frequencies from calculated, normalized autocorrelation values. More specifically, the optimal estimate of the Doppler frequency according to Schmidl is the estimate that minimizes the mean squared error between the known Bessel function values and the normalized autocorrelation values. (See Fig. 7, equation 20 and

column 6, lines 1-65 of Schmidl). However, Schmidl fails to overcome the deficiencies of Dahlman. More specifically, Schmidl fails to disclose a Doppler frequency estimator that includes a normalizer configured to *normalizes channel estimates* a recited in claim 1.

It is well known that in order to support a rejection under 35 U.S.C. §103, three basic criteria must be met. First, there must be some motivation to modify/combine the applied references. Second, there must be some expectation of success, and finally, the combination must teach each and every claimed element. In the present case, claims 1, 3, 5 and 6 are not rendered unpatentable by the combination of Dahlman and Schmidl for at least the reason that the combination fails to disclose each and every claimed element. More specifically, since Dahlman and Schmidl both fail to disclose or suggest a Doppler frequency estimator that comprises a normalizer configured to *normalize* at least two *channel estimates* as claimed, the combination of these two references cannot possibly disclose or suggest said feature. Therefore, even if one skilled in the art were motivated to combine Dahlman and Schmidl as suggested by the Office Action the combination would still fail to render claims 1, 3, 5 and 6 unpatentable.

In rejection claims 2, 3, 5 and 6, the Office Action asserts that the present invention as defined in claims 2, 3, 5 and 6 is unpatentable over the combination of Dahlman and Schmidl because although Dahlman fails to disclose "normalizing the two channel estimates and then calculating the difference between the two normalized channel estimates", Schmidl discloses "estimation of Doppler frequency including using normalized values in the Doppler frequency estimation." To support this assertion the Office Action points to column 6, lines 25-26 and 43-64 of Schmidl. This assertion is unfounded for the following reason.

Nowhere in Schmidl is there any disclosure or suggestion of normalizing channel estimates. The cited passage (i.e., column 6, lines 25-26 and 43-64 of Schmidl) discloses normalizing *autocorrelation values*, not *channel estimates*. Therefore, even if one skilled in the art were motivated to combine the normalization of autocorrelation values as disclosed in Schmidl, the combination would still fail to disclose or suggest normalizing

channel estimates as claimed. Accordingly, Application respectfully requests reconsideration and withdrawal of the rejection of claims 3, 5 and 6 under 35 U.S.C. §103.

On page 4, the Office Action rejects claim 9 under 35 U.S.C. §103(a) as allegedly being unpatentable over Dahlman in view of U.S. Patent No. 6,377,813 to Kansakoski et al. ("Kansakoski"). Applicant respectfully traverses this rejection.

Claim 9 depends from independent claim 1. Therefore, claim 9 is patentably distinguishable over Dahlman for at least those reasons presented above with respect to claim 1. Furthermore, Kansakoski fails to overcome the deficiencies of Dahlman.

Kansakoski discloses a method and apparatus for forward link closed loop power control in a third generation wideband CDMA system. The system includes, among other things, a device for estimating a Doppler condition of a mobile station, and a device for inferring the velocity of the mobile station. However, Kansakoski fails to disclose or suggest a Doppler frequency estimator comprising a normalizer configured to normalize at least two channel estimates.

Since Dahlman and Kansakoski both fail to disclose or suggest a Doppler frequency estimator that includes a normalizer configured to normalize at least two channel estimates as claimed, the combination of these two references cannot possible disclose said feature. Therefore, even if one skilled in the art were motivated to combine Dahlman and Kansakoski as suggested by the Office Action, the combination would still fail to render claim 9 unpatentable for at least the reason that the combination fails to disclose or suggest each and every claimed element. Accordingly, Applicant respectfully request reconsideration and withdrawal of the rejection of claim 9 under 35 U.S.C. §103.

On page 5, the Office Action rejects claims 16 under 35 U.S.C. §103(a) as allegedly being unpatentable over Dahlman in view of U.S. Patent No. 6,542,562 to Ostberg et al. ("Ostberg"). Applicant respectfully traverses this rejection.

Independent claim 16, as amended, recites an apparatus that includes, *inter alia*, a Doppler frequency estimator comprising a normalizer configured to normalize at least two channel estimates. Accordingly, claim 16 is patentably distinguishable over Dahlman for at least the reason that Dahlman fails to disclose or suggest a Doppler frequency estimator

comprising a normalizer as claimed. Furthermore, Ostberg fails to overcome the deficiencies of Dahlman. More specifically, Ostberg fails to disclose or suggest a normalizer as claimed.

Since Dahlman and Ostberg both fail to disclose or suggest a Doppler frequency estimator that includes a normalizer as claimed, the combination of these two references cannot possible disclose said feature. Therefore, even if one skilled in the art were motivated to combine Dahlman and Ostberg as suggested by the Office Action, the combination would still fail to render claim 16 unpatentable for at least the reason that the combination fails to disclose or suggest each and every claimed element. Accordingly, Applicant respectfully request reconsideration and withdrawal of the rejection of claim 16 under 35 U.S.C. §103.

The application is in condition for allowance. Notice of same is earnestly solicited. Should the Examiner have any questions regarding this application, the Examiner is invited to call the undersigned at the telephone number provided below.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: Penny L. Caudle
Penny L. Caudle
Registration No. 46,607

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

Date: September 26, 2003